Klamath Network Featured Creature
March, 2007

Ochre or Common Seastar
(*Pisaster ochraceus*)

General Description:

The ochre or common sea star (*Pisaster ochraceus*) is perhaps the most familiar animal of the rocky Pacific coast. It is a member of the phylum Echinodermata, composed of many of the best known marine invertebrates. Echinoderms are known for their 5-sided, radial symmetry. The five rays of the ochre sea star are relatively long; its diameter typically ranges from 6-14 inches. The species has purple and orange color phases. The underside has rows of tube feet with miniature suction cups that allow it to slowly move, but remain attached to wave battered rocks of the open coast. The rough texture of the upper surface is covered with almost microscopic pincers, or pedicilllariae, which can cling to human skin. The water in which the sea stars may be found can be full of minute larvae of barnacles seeking a surface on which to attach and grow. The "pincers," or pedicellariae, keep the surface of the star free of such attaching organisms.

Feeding:

The ochre sea star is a carnivore. Like other Echinoderms, it can evert its stomach. This gives it the ability to eat almost anything it can get its stomach into or around. Preferred prey is bivalves, like mussels. It is commonly assumed that the sea star pries open its prey, but this may not required. The stomach can squeeze into a very narrow opening. The stomach can also be wrapped around smaller prey like snails. All digestion takes place outside the body.

Behavior:

The ochre sea star is a voracious predator. Mobile invertebrates like snails try to flee its presence, which they may detect nearby by chemical means, moving away with as much alacrity as they can muster.

Clump of ochre sea stars at Redwood National Park. Photo by Cara McGary.

Because the ochre sea star is such an effective and omnivorous predator, it plays an important role in structuring intertidal communities. In fact, classical ecological research involving experimental removal of ochre sea stars by ecologist Bob Paine lead to the coining of the classical ecological term "keystone species." This term is used to denote species that have disproportionately important effects on community structure and composition. The ochre sea star is the first described keystone species, and is still a textbook example. Its keystone role could not have been easily predicted.

It co-exists with other carnivores, but their removal does not cause dramatic changes to the benthic community as does removing sea stars.

Habitat and Distribution:

Rocky intertidal habitats of the open coast are where ochre sea stars are commonly found. They may also be found on pilings and in more protected waters. Their distribution extends from Sitka, Alaska to central California.

Where to see in the Network:

Ochre sea stars are common along the rocky coast of Redwood National Parks. The Klamath Network is monitoring the ochre sea star and the communities it structures at Redwood as part of a broad intertidal monitoring partnership. These communities appear to be in better shape than during the 1970's when driftwood and sediment scouring was more prevalent due to effects of more intensive land use then.

More Information:

Ricketts, EF, and J. Calvin. *Between Pacific Tides.* Standford University Press. First published in 1939. Revised and updated in later editions by J. Hedgpeth.

Marine Monitoring Partnerships:
http://www.mms.gov/omm/pacific/enviro/mint.htm.